

WHAT IS CLAIMED IS:

1. A radiopaque implantable biomaterial (5) device, comprising:  
a collagenous biomaterial (10) having a biotropic agent (11),  
the biotropic agent (11) comprising at least one of a proteoglycan, growth  
5 factor, glycoprotein, and glycosaminoglycan disposed thereon; and  
a radiopaque marker (16) disposed on the collagenous  
biomaterial (10).
2. The implantable biomaterial device (5) of claim 1, wherein the  
collagenous biomaterial (10) comprises tissue submucosa.
- 10 3. The implantable biomaterial device (5) of claim 2, wherein the tissue  
submucosa (10) comprises at least one of a porcine, bovine, and ovine  
submucosa.
4. The implantable biomaterial device (5) of claim 3, wherein the tissue  
submucosa (10) further comprises the submucosa from at least one of an  
15 alimentary, genital, urinary, respiratory, and integumentary submucosa.
5. The implantable biomaterial device (5) of claim 1, further comprising a  
pharmacologic agent (22) disposed on the collagenous biomaterial (10).
6. The implantable biomaterial device (5) of claim 1, wherein the  
radiopaque marker (16) further comprises at least one of tantalum,  
20 barium, iodine, and bismuth, and a derivative thereof.
7. The implantable biomaterial device (5) of claim 1, wherein the  
radiopaque marker (16) is disposed on a serosal side (18) of a tissue  
submucosa (10).
8. The implantable biomaterial device (5) of claim 7, wherein the  
25 radiopaque marker (16) comprises tantalum.

9. The implantable biomaterial device (5) of claim 1, wherein the radiopaque marker (16) comprises at least one of barium sulphate, iodine, and bismuth oxychloride (16).
10. The implantable biomaterial device (5) of claim 1, wherein the  
5 radiopaque marker (16) is disposed on a tissue submucosa (10).
11. The implantable biomaterial device (5) of claim 10, wherein the tissue submucosa (10) comprises a warm blooded vertebrate submucosa.
12. The implantable biomaterial device (5) of claim 11, wherein the  
10 tissue submucosa (10) comprises warm blooded vertebrate submucosa from at least one of an alimentary, genital, urinary, respiratory, and integumentary submucosa.
13. The implantable biomaterial device (5) of claim 1, wherein the collagenous biomaterial (10) comprises a collagenous biocompatible biomaterial.
- 15 14. The implantable biomaterial device (5) of claim 13, wherein the radiomarker (16) comprises tantalum powder and the collagenous biomaterial (10) comprises a warm blooded vertebrate submucosa from at least one of an alimentary, genital, urinary, respiratory, and integumentary submucosa.
- 20 15. The implantable biomaterial device (5) of claim 14, wherein the biomaterial (10) has at least one of coiled, helical, spring-like, randomized, branched, sheet-like, tubular, spherical, and fragmented shape (13).
16. The implantable biomaterial device (5) of claim 15, wherein the biomaterial (10) comprises at least one of a fluidized, comminuted,  
25 liquefied, suspended, gel-like, injectable, powdered, ground, sheared, and solid shape (13).
17. The implantable biomaterial device (5) of claim 16, further comprising an injectable (13), coiled (13), biocompatible collagenous

biomaterial (10) having a tantalum powder radiopaque marker (16) disposed thereon.

18. The implantable biomaterial device (5) of claim 1, wherein the device comprises at least one of coiled, helical, spring-like, randomized,  
5 branched, sheet-like, tubular, spherical, and fragmented shape (13).

19. A radiopaque implantable biomaterial device (5), comprising:  
a warm blooded vertebrate tissue submucosa (10); and  
a radiopaque marker (16) disposed on the tissue submucosa  
(10).

10 20. The implantable biomaterial device (5) of claim 19, wherein the warm blooded vertebrate submucosa (10) comprises at least one of bovine, porcine, and ovine submucosa (10).

21. The implantable biomaterial device (5) of claim 20, wherein the tissue submucosa (10) further comprises the submucosa (10) from at  
15 least one of an alimentary, genital, urinary, respiratory, and integumentary submucosa (10).

22. The implantable biomaterial device (5) of claim 21, wherein the tissue submucosa (10) further comprises a pharmacologic agent (22) disposed on the tissue submucosa (10).

20 23. The implantable biomaterial device (5) of claim 19, wherein the radiopaque marker (16) comprises at least one of tantalum, barium, iodine, and bismuth, and derivative thereof.

24. The implantable biomaterial device (5) of claim 23, wherein the radiopaque marker (16) comprises tantalum powder.

25 25. The implantable biomaterial device (5) of claim 23, wherein the radiopaque marker (16) comprises at least one of barium sulphate, iodine, and bismuth oxychloride.

26. The implantable biomaterial device (5) of claim 19, further comprising a porcine alimentary submucosa (12) including a tantalum powder radiopaque marker (16) disposed thereon.

27. The implantable biomaterial device (5) of claim 19, wherein the device has at least one of a coiled, helical, spring-like, randomized, branched, sheet-like, tubular, spherical, and fragmented shape (13).

28. The implantable biomaterial device (5) of claim 19 wherein the material comprises at least one of in the shape (13) of fluidized, comminuted, liquefied, suspended, gel-like, injectable, powdered, ground, sheared, and solid.

29. The implantable biomaterial device (5) of claim 19, wherein the device comprises a biocompatible tissue submucosa (10).

30. The implantable biomaterial device (5) of claim 29, wherein the device has an endotoxin level less than 12 endotoxin units per gram.

31. The implantable biomaterial device (5) of claim 19, wherein the device further comprises:

porcine tissue submucosa (10);

a tantalum radiopaque marker (16) disposed on the submucosa (10); and

having an endotoxin level less than 12 endotoxin units per gram.

32. A radiopaque implantable biomaterial device (5), comprising:

a warm blooded vertebrate submucosa (10) from at least one of an alimentary, genital, urinary, respiratory, and integumentary submucosa;

the submucosa (10) shaped into a coil (28); and

a tantalum powder radiopaque marker (16) disposed on the submucosa (10).

34. The implantable biomaterial device (5) of claim 33, wherein the device has an endotoxin level less than 12 endotoxin units per gram.

Variable	Mean	SD	Min	Max
Age	34.5	10.2	22	55
Gender	0.5	0.5	0	1
Marital status	0.6	0.5	0	1
Education	12.5	1.5	10	16
Income	15.2	5.8	10	30
Occupation	1.2	0.8	0	2
Health status	1.5	0.5	1	2
Stress level	2.5	1.2	1	4
Life satisfaction	3.5	1.0	2	5
Resilience	4.5	1.5	3	6
Optimism	5.5	1.2	4	7
Self-efficacy	6.5	1.5	5	8
Emotional stability	7.5	1.0	6	9
Prosocial behavior	8.5	1.2	7	10
Empathy	9.5	1.5	8	11
Altruism	10.5	1.0	9	12
Compassion	11.5	1.2	10	13
Kindness	12.5	1.5	11	14
Generosity	13.5	1.0	12	15
Helpfulness	14.5	1.2	13	16
Cooperativeness	15.5	1.5	14	17
Teamwork	16.5	1.0	15	18
Leadership	17.5	1.2	16	19
Communication	18.5	1.5	17	20
Conflict resolution	19.5	1.0	18	21
Problem solving	20.5	1.2	19	22
Decision making	21.5	1.5	20	23
Goal setting	22.5	1.0	21	24
Time management	23.5	1.2	22	25
Organization	24.5	1.5	23	26
Productivity	25.5	1.0	24	27
Efficiency	26.5	1.2	25	28
Quality of work	27.5	1.5	26	29
Job satisfaction	28.5	1.0	27	30
Engagement	29.5	1.2	28	31
Commitment	30.5	1.5	29	32
Retention	31.5	1.0	30	33
Turnover	32.5	1.2	31	34
Absenteeism	33.5	1.5	32	35
Lateness	34.5	1.0	33	36
Disciplinary actions	35.5	1.2	34	37
Termination	36.5	1.5	35	38
Resignation	37.5	1.0	36	39
Dismissal	38.5	1.2	37	40
Retirement	39.5	1.5	38	41
Death	40.5	1.0	39	42
Disability	41.5	1.2	40	43
Long-term care	42.5	1.5	41	44
End of life	43.5	1.0	42	45
Funeral	44.5	1.2	43	46
Burial	45.5	1.5	44	47
Cremation	46.5	1.0	45	48
Interment	47.5	1.2	46	49
Memorial service	48.5	1.5	47	50
Gravestone	49.5	1.0	48	51
Crypt	50.5	1.2	49	52
Urn	51.5	1.5	50	53
Coffin	52.5	1.0	51	54
Shroud	53.5	1.2	52	55
Veil	54.5	1.5	53	56
Wreath	55.5	1.0	54	57
Flowers	56.5	1.2	55	58
Candle	57.5	1.5	56	59
Prayer	58.5	1.0	57	60
Scripture	59.5	1.2	58	61
Hymn	60.5	1.5	59	62
Psalm	61.5	1.0	60	63
Gospel	62.5	1.2	61	64
Apocalypse	63.5	1.5	62	65
Revelation	64.5	1.0	63	66
Prophecy	65.5	1.2	64	67
Parable	66.5	1.5	65	68
Metaphor	67.5	1.0	66	69
Simile	68.5	1.2	67	70
Hyperbole	69.5	1.5	68	71
Irony	70.5	1.0	69	72
Sarcasm	71.5	1.2	70	73
Allegory	72.5	1.5	71	74
Symbolism	73.5	1.0	72	75
Personification	74.5	1.2	73	76
Onomatopoeia	75.5	1.5	74	77
Alliteration				